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**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Laurent JOUANET et al.

Attn: PCT Branch

Application No. New U.S. National Stage of PCT/FR2004/002736

Filed: April 14, 2006

Docket No.: 127729

For: MOVEMENT DETECTOR HAVING SIX DEGREES OF FREEDOM WITH  
THREE POSITION SENSORS AND METHOD FOR PRODUCTION OF A  
SENSOR

**TRANSLATION OF THE ANNEXES TO THE  
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Attached hereto is a translation of the annexes to the International Preliminary  
Report on Patentability (Form PCT/IPEA/409). The attached translated material replaces the  
claims in their entirety.

Respectfully submitted,



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## Claims

1. Movement detector having six degrees of freedom comprising a support  
(1) on which three position sensors (2a), (2b) and (2c) are arranged  
5 according to three orthogonal axes, each sensor comprising a rigid body (3),  
conducting areas (6b) arranged on the rigid body (3) and an electrically  
conducting deformable element (4) presenting a rest position in which it is  
isolated from the conducting areas (6b), and moving from the rest position to  
an active position in response to a high-speed movement of predetermined  
10 direction and orientation, detector characterized in that each sensor (2a, 2b,  
2c) comprises four conducting areas (6b), arranged two by two on two  
opposite inside walls of the rigid body (3), and that the deformable element  
(4) associated with each sensor (2a, 2b, 2c) is in equilibrium around its  
central part, responds to a translation along a predetermined axis by bending  
15 causing a simultaneous and temporary contact of its ends with the two  
conducting areas (6b) of one and the same inside wall and responds to a  
rotation around a predetermined axis by a pivoting causing a simultaneous  
and temporary contact of its ends with two conducting areas (6b) arranged  
on opposite inside walls.

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2. Detector according to claim 1, characterized in that it comprises an  
electronic processing circuit (15) connected to the conducting areas (6b) of  
the three sensors.

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3. Detector according to one of the claims 1 and 2, characterized in that the  
deformable element (4) is a beam in equilibrium around its transverse  
median axis.

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4. Detector according to claim 3, characterized in that the beam comprises  
conducting areas (6a) at the ends thereof.

5. Detector according to one of the claims 1 and 2, characterized in that the deformable element (4) is a disc in equilibrium around its central axis.

5 6. Detector according to claim 5, characterized in that the disc comprises a peripheral conducting area (6a) on each of its faces.

7. Detector according to any one of the claims 1 to 6, characterized in that the deformable element (4) is electrically connected to a power supply contact area (10) arranged on the rigid body (3) of the sensor.

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8. Detector according to any one of the claims 1 to 7, characterized in that the deformable element (4) is in an equilibrium position corresponding to the rest position of the sensor for any movement the acceleration whereof is less than or equal to the force of gravity G.

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9. Detector according to any one of the claims 1 to 8, characterized in that the rigid body of a sensor comprises two substrates (7a) and (7b) arranged face to face, connected by balls (8) constituting an electrical interconnection between the conducting areas (6b) of one of the substrates (7a) and output electrical contact areas (9) formed on the other substrate (7b).

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10. Detector according to claim 9, characterized in that the deformable element (4) is formed by two deformable half-elements comprising a conducting layer (12), supported by a central pillar (11), formed on a central power supply contact area (10), formed on the corresponding substrate (7a, 7b).

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11. Method for production of a sensor according to claim 10, characterized in that it is achieved by microelectronics techniques and comprises:

- formation on each of the substrates (7a, 7b) of conducting areas (6b), of power supply contact areas (10) and, on one of the substrates (7b), of output electrical contact areas (9),
- formation on each of the substrates (7a, 7b) of a central pillar (11), in  
5 contact with the power supply contact area (10) and supporting a conducting layer (12) designed to form a deformable half-element,
- installation of balls (8) on the output electrical contact areas (9),
- hybridization of the two substrates (7a) and (7b) arranged face to face.